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**ABSTRACT OF THE INVENTION**

An adaptive broadcast radar system for tracking targets is disclosed. the radar system includes a transmitter having sub-apertures and a receiver having sub-apertures. The transmitter sub-apertures generate and code a signal waveform. The signal waveform is coded with data about the transmitter, including the degrees of freedom. The receiver receives signals comprising direct path signals and scattered signals correlating to the signal waveforms from the transmitter. The receiver includes a signal processor that regenerates a transmit beam for the coded data, delay, and doppler information from the received signals. The signal processor generates data quads encapsulating the information.

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